polarity-free PSU filter for ham radio

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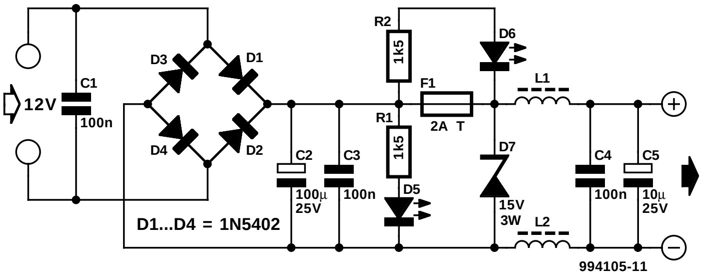

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Many radio amateurs will not fail to recall the chaotic situations that may occur during fielddays or contests, when several radios have to be connected in a hurry and under circumstances less comfortable than those in the shack at home. For instance, many operators may be busy at the same time connecting up the power leads to equipment which is not theirs. In such situations, supply polarity errors may readily occur, with disastrous results.

Many currently available handhelds from Sony, Yaesu, Standard, Kenwood, Alinco and other makes may be powered from an external vehicle battery. However, the supply polarity on the external power connector may not always be known or easily found out when a hectic situation arises (traditionally, few hams have the Owners Manual available…).

This circuit was developed to allow handheld rigs to be connected to an external 12V vehicle battery without paying attention to polarity. This function is due to a bridge rectifier, D1-D4, at the input of the circuit. Irrespective of the battery polarity, the radio will always receive the correct supply voltage.

Additional functions of the circuit include an effective noise filter (L1-L2-C4-C5), high-voltage DC protection (zener diode D7), and blown fuse/power indicators (LEDs D6 and D5 respectively). Coils L1 and L2 consist of 8 turns of 24SWG (0.6 mm) enamelled copper wire on a large ferrite toroidal core from Amidon's T series (check coil saturation specification!). Alternatively, use 'EMI suppression beads' type 4330 020 3326 from Philips Components. The LEDs should be high-efficiency types.

The circuit as shown can be used with any modern handheld that draws less than 2 A at supply voltages between 4.5 V and 14 V. In fact, most of these rigs will draw 1.3-1.5 A at 13.8 V for 5 watts of RF output power.

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